TITLE OF THE INVENTION

Vertical Planting System

CROSS-REFERENCE TO RELATED APPLICATIONS

Not applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not applicable

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates generally to systems for growing plants and vegetables, and more particularly to a vertical growing system having individual containers each having a plurality of upwardly facing planting areas and nourished primarily from a single source location of nutrients and water which filters centrally downwardly therethrough.

Description of Related Art

Vertical planters which define vertical columns of planting pots which are irrigated by central irrigation sources are well known. One such column planter is disclosed in U.S. Patent 5,305,551 invented by Orlov which teaches a column planter supported within a tank filled with water including planting pots which are stackable one on top of each other to form at least one column supported within the water-filled tank.

Orlov has also invented an arrangement for growing plants as disclosed in U.S. Patent 5,136,807 teaching a multiplicity of containers which are stacked to form a self-

supporting column. Irrigation water flowing downwardly through each of the apertured containers flows into an excess fluid draining system of this disclosure.

In U.S. Patent 5,533,302, Lynch teaches a modular planting system for growing a plurality of plants arranged in a vertical column. Modular planting units are stacked together facilitating a virtually continuous vertical central column of growing medium for supporting plants in pairs of plant receptacles which project from both sides of the center column.

Johnson, in U.S. Patent 5,428,922, teaches a multi-tier garden planter including a plurality of retaining tubes centrally supporting a plurality of vertically oriented spaced apart flared tubs or receptacles each containing soil. An irrigation structure facilitates plant growth. The tubs are formed of arcuate segments of lightweight sheet plastic material connected together by a unique locking assembly for convenient transport and storage.

Another vertical planter disclosed by Lendel in U.S. Patent 5,438,797, includes spaced apart tiered flower pots centered about an upright pole which is segmented to allow disassembly and shipping. Soil in each of the flower pots contributes to the support of the entire vertical planter column.

The following additional U.S. Patents are known to applicant to teach other forms of vertical plant and vegetable growing columns as follows:

U.S. Patent 6,178,692 to Graven

U.S. Patent 5,918,416 to Ammann, Jr.

U.S. Patent 6,393,764 to Smith

U.S. Patent 6,477,805 to Ware

The present invention also discloses a uniquely configured vertical planting system including identical individual growing containers which are vertically stackable in self-aligning and self-locking fashion and supported by an upright support pole which is driven into the ground for its support. Each of the growing containers includes outwardly tapering side walls which extend to define an open upper surface having uniformly spaced preferably round planting areas which extend downwardly into soil or growing media placed into the hollow interior of each growing container. A unique nutrient and water diffuser box receives water and nutrient from a multi-conduit source immediately above its open upper surface, diffusing the nutrient and water downwardly through the central portion of each of the growing containers, the excess fluid draining into a fluid connector positioned beneath the bottom of the container in the growing column for dispersion of the excess fluid into the ground.

BRIEF SUMMARY OF THE INVENTION

This invention is directed to a vertical planting system comprising individual growing containers each having a bottom wall, outwardly tapered side walls defining a hollow interior and an open top surface, the upper margins of the side walls thereof defining discrete radially extending spaced upwardly facing planting areas. The containers are vertically stackable one on top of the next in self-aligning fashion to form a vertical growing column supported by an elongated upright support pole driven into the ground and inserted through an aperture in the bottom wall of each container. A nutrient and water diffuser box is vertically stackable and self aligning atop a top of one of the containers in the growing column and support pole receiving aperture formed

therethrough and slidably engaged over the support pole, the bottom of the diffuser box also including fluid drainage hole formed through and positioned over said bottom wall of said diffuser box. A fluid collector structured to supportively receive and be self-aligned with a bottom one of the containers in the growing column are also provided. A fluid nutrient and water discharge unit flows fluid nutrient and water into the diffuser box for downwardly draining through a central portion of growing media in each successive container.

It is therefore an object of this invention to provide a vertical planting system having STYROFOAM molded individual identical growing containers which are self-aligning and vertically stackable such that the planting areas of each container are unobstructed for plant growth by the next upwardly positioned growing container whose planting areas have been automatically rotationally offset about an upright central axis by the self-aligning structure of each of the containers.

Still another object of this invention is to provide an easily assemblable multi-tiered vertical planting system having identical growing containers which may be stacked in a range of selected numbers to define a vertical growing column of any desirable reasonable height.

Still another object of this invention is to provide a vertical planting system with a unique and easily managed nutrient and water flow control system which flows liquid nutrient and water by dispersion centrally downwardly through the central portion of the growing media within each of the system growing containers.

Yet another object of this invention is to provide a vertical planting system which includes a plurality of identical growing containers formed of molded STYROFOAM for

light weight and economy and which include self-aligning and self-locking structure for facilitating quick assembly and proper alignment and offset orientation between each upwardly successive growing container.

In accordance with these and other objects which will become apparent hereinafter, the instant invention will now be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

Figure 1 is a perspective view of the vertical plant growing system of the present invention.

Figure 1A is a schematic side elevation simplistic schematic view of the invention.

Figure 2 is a side elevation section view of the fluid nutrient and water discharge member **16** shown in Figure 1.

Figure 3 is an upper perspective view of a growing container of the invention.

Figure 4 is a lower perspective view of the growing container of the invention.

Figure 5 is a top plan view of the growing container showing the next lower growing container in a vertical column of growing containers in phantom.

Figure 6 is a bottom plan view of the growing container.

Figure 7 is a lower perspective view of a nutrient and water diffuser box of the invention.

Figure 8 is an upper perspective view of the nutrient and water diffuser box.

Figure 9 is an upper perspective view of a fluid collector of the invention.

Figure 10 is a lower perspective view of the fluid collector.

Figure 11 is a vertical section view of the fluid collector.

Figure 12 is a bottom plan view of the fluid collector.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings and particularly to Figures 1 and 1A, the system of the invention is there shown generally at numeral **10** as a vertical planting system which includes a plurality of growing containers **12** each formed as a single unit of molded STYROFOAM and stackably arranged in self-aligning and self-locking fashion into a vertical column about a central upright axis **P** of an elongated upright support pole **20**. The invention **10** also includes a nutrient and water diffuser box **14** positioned at the top of the column of growing containers **12** and a fluid collector **18** which supports the column of containers **12** and is positioned directly against the bottom surface of the bottom one of the containers **12**.

As also seen in Figure 1A, the fluid collector **18** is supported atop a swivel plate **76** which is positioned atop the ground **G** around an elongated ½" o.d. ground stake **78** which is first driven into the ground a distance of about 24", the remaining 16" thereof extending above the swivel plate **76** to slidably support the lower end of the support pole **20** of larger, ¾" o.d. to slidably fit over the ground stake **78**.

As also seen in Figure 2, the fluid nutrient and water discharge unit **16** includes a T-fitting **22** connected at one horizontal leg thereof to a water supply conduit **28** and at a downwardly extending leg thereof supportively over the upper end of the support pole **20**. A separate liquid nutrient supply conduit **24** extends into an aperture **26** formed in the side of the downwardly extending leg of the T-fitting **22** and is fitted between the outside diameter of the support pole **20** and the inside wall of the downward leg of the T-fitting **22**.

By this arrangement, water flows in the direction of arrow **C** through water conduit **28** into the interior **22a** of the T-fitting **22** and downwardly in the direction of arrows **D** along the outside of the support pole **20**. Separately, fluid nutrient flows downwardly in the direction of arrows **B** from the lower end **24b** of the nutrient supply conduit **24** into the nutrient and water diffuser box **14** which disperses these fluids as described more completely herebelow.

Again referring to Figure 1A, these fluid nutrients and water flow downwardly through the central portions of the nutrient and diffuser box **14**, then centrally through the growing medium contained in each of the containers **12** in the direction of arrow **B**, and finally into the fluid collector **18** for discharge in the direction of arrows **F** onto and into the ground **G** as facilitated by a gap around the support pole **20**.

Referring additionally to Figures 3 to 6, the details of the growing container **12** are there shown. Each growing container **12** includes a bottom wall **36**, upwardly and outwardly expanding side walls shown typically at **34**, and an open upper surface including a plurality of generally round planting areas **32** defined by the upper margins **30** of the side walls **34**. Each of the growing containers **12** is formed as a single unit of relatively thick walled molded STYROFOAM for lightness, strength and economy of manufacture.

The side walls **34** are preferably of a conical-like upwardly extending configuration and collectively define a hollow upwardly facing interior **46** which is filled with a growing medium or, more conventionally dirt (not shown for clarity), which is filled up to in proximity to the upper margins **30** of the side walls **34**. The bottom wall **36** includes a central support pole receiving aperture **44** and a plurality of drainage holes **38**. These

drainage holes **38** function to facilitate the downward flow of nutrient and water in the direction of arrow **E** as previously described in Figure 1A.

Formed in the bottom wall **36** are corner alignment cavities **42** as best seen in Figures 4 and 6 which receive and self-align with molded pins **40** formed into the upper margin **30** as best seen in Figures 3 and 5. An alignment notch **41** is also provided around each of the alignment pins **40**, the notches **41** substantially mating with the outer lower corners **43** of each of the containers **12** positioned immediately adjacent the alignment cavities **42**. By this arrangement, the self-aligning, self-locking column-stacking features of the growing containers **12** are thereby achieved.

As shown, the preferred embodiment of the invention **10** incorporates an orthogonal or 90° orientation of four separate growing areas **32** defined by four separate conically-shaped upwardly expanding side walls **34** and the associated upper margins **30** thereof. Vertical misalignment of the successive growing areas **32** and **32'** as seen in Figure 5 in phantom of each upwardly and downwardly successive growing container is achieved by the 45° non-alignment of successive growing containers **12**, again as best seen in Figures 1 and 5.

Referring now to Figures 7 and 8, the nutrient and water diffuser box **14** is there shown. This diffuser box **14** also formed of molded thick walled STYROFOAM formed as a unit includes a bottom wall **52** having a central pole support receiving aperture **58** and drainage apertures **60** formed downwardly therethrough. Alignment cavities **56** which mate with, and are self-aligned by, the molded pins **40** of the top growing container **12** atop which the diffuser box **14** is positioned are also provided in the bottom wall **52**. Side

walls **50** upwardly extend to define an open top surface **54** into which the fluid nutrient and water flow for downward dispersion through drain holes **38** as previously described.

Referring lastly to Figures 9 to 12, the fluid collector **18** is there shown. This fluid collector **18** is also formed of very heavy wall molded STYROFOAM formed as a unit. The side walls **62** which outwardly extend from the bottom wall **74** are formed of extra heavy or thick STYROFOAM material for added strength as the fluid collector **18** supports the entire weight of the growing column of containers **12** and the growing medium and plants placed therewith.

The bottom wall **74** includes a support collar **72** having a central pole support receiving aperture **70** formed axially therethrough in alignment with a central axis **P** of the entire assembled system **10**. Aperture **70** is also slightly larger than the o.d. of the support pole **20** to facilitate fluid drainage therebetween. The side walls **62** upwardly extend to a heavily strengthened upper margin **64** which defines an open upper surface **66**. Upwardly extending alignment pins **68** are provided which mate with the cavities **42** formed in the bottom wall **36** of the growing containers **12**.

While the instant invention has been shown and described herein in what are conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of the invention, which is therefore not to be limited to the details disclosed herein, but is to be afforded the full scope of the claims so as to embrace any and all equivalent apparatus and articles.